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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,657	03/25/2004	Hajime Kanazawa	1232-5358	6105
27123	7590	03/14/2006	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 03/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,657

Applicant(s)

KANAZAWA ET AL.

Examiner

Shun Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0804.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "14" and "15" have both been used to designate EUV light detector unit. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Figure 12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in

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compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. Claims 3-7 and 9 are objected to because of the following informalities:
- (a) in claim 3, "the light intensity detector unit is" on line 5 should probably be --said plural light intensity detector units are--; and
 - (b) in claim 4, "the light intensity detector unit is" on lines 2-3 should probably be --said plural light intensity detector units are--; and
 - (c) in claim 5, "a surface" on line 2 should probably be --said surface--;
 - (d) in claim 5, "the light intensity detector unit is" on line 3 should probably be --said plural light intensity detector units are--;
 - (e) in claim 6, "the light intensity detector unit" on line 4 should probably be --each of said plural light intensity detector units--;

(f) in claim 7, "the light intensity detector unit" on lines 4-5 should probably be --each of said plural light intensity detector units--; and

(g) in claim 9, "the light intensity detector unit" on lines 2-3 should probably be --each of said plural light intensity detector units--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 2, 3, and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It should be noted that a claim may be rendered indefinite by reference to an object that is variable (MPEP § 2173.05(b)).

In regard to claim 2 which is dependent on claim 1, a limitation in the claim to a light intensity detector unit that recited "in a range where a solid angle viewed from the light intensity detector unit to a condensed point of the light is below 0.024 steradians" is indefinite because the relationship of parts was not based on any known standard for sizing the light intensity detector unit input aperture to the condensed point of the light, but on the unspecified distance from the light intensity detector unit to the condensed point of the light.

In regard to claim 3 (which is dependent on claim 1) and claim 5 (which is dependent on claim 3), a limitation in the claim to light intensity detector units that

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recited "the light intensity detector unit is arranged on a spherical surface that has a center at a condensed point" is indefinite because the relationship of parts was not based on any known standard for arranging the light intensity detector units, but on the unspecified distance from the light intensity detector units to a condensed point of the light.

8. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. It should be noted that claim 8 recites the limitation "plural surfaces is orthogonal to plural surfaces". The omitted structural cooperative relationships are: the (first?) plural surfaces and the (second?) plural surfaces.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 7, and 9-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Berger (US 6,781,135).

In regard to claim 1, Berger discloses (column 6, lines 5-26; Figs. 1 and 2) a light intensity distribution measuring apparatus for measuring a light intensity distribution in

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light with a wavelength of 20 nm or smaller (column 1, lines 39-42) emitted from a light source, said light intensity distribution measuring apparatus comprising plural light intensity detector units (60) each including a mirror (70) and a photoelectric conversion element (72), said light intensity distribution measuring apparatus measuring the light intensity distribution so that an incident angle of the light incident upon the mirror (70) is a predetermined angle (*i.e.*, "calibrated angle"; column 5, lines 26-49; such as at 45°; column 5, line 66 to column 6, line 1).

In regard to claim **7** which is dependent on claim 1, Berger also discloses (column 5, line 66 to column 6, line 1; Figs. 1 and 2) that the incident angle (*e.g.*, 45°) of the light upon the mirror (70) is approximately equal to a Brewster angle for the light in the light intensity distribution detector unit (60) since a " ... Brewster angle is 42.6° for the EUV light having a wavelength of 13.5 nm ... " (see lines 7-12 on pg. 12 of the specification).

In regard to claim **9** which is dependent on claim 7, Berger also discloses (Figs. 1 and 2) that the light intensity distribution detector unit (60) is rotatable (around an axis defined by bore 66) by approximately 90° while maintaining the incident angle of the EUV light upon the mirror (70).

In regard to claim **10**, Berger discloses (column 6, lines 5-26; Figs. 1 and 2) a light intensity distribution measuring method that uses a light intensity distribution measuring apparatus for measuring a light intensity distribution of light with a wavelength of 20 nm or smaller (column 1, lines 39-42) emitted from a light source, said light intensity distribution measuring apparatus comprising plural light intensity detector

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units (60) each including a mirror (70) and a photoelectric conversion element (72), said light intensity distribution measuring apparatus measuring the light intensity distribution so that an incident angle of the light incident upon the mirror (70) is a predetermined angle (*i.e.*, "calibrated angle"; column 5, lines 26-49; such as at 45°; column 5, line 66 to column 6, line 1).

In regard to claim **11**, Berger discloses (column 6, lines 5-26; Figs. 1 and 2) a light intensity distribution measuring method for measuring a light intensity distribution of light with a wavelength of 20 nm or smaller (column 1, lines 39-42) emitted from a light source, said light intensity distribution measuring method using a light intensity detector unit (60) that includes a mirror (70) and a photoelectric conversion element (72) which are arranged so that an incident angle (*e.g.*, 45°; column 5, line 66 to column 6, line 1) of the light upon the mirror is approximately equal to a Brewster angle for the light, and said light intensity distribution measuring method measuring the light intensity of the light reflected by the mirror (70). Berger also discloses (column 2, lines 2-7) that light source is *e.g.*, an EUV discharge source which provides incoherent EUV radiation. Incoherent radiation have different directions of polarization by approximately 90° at approximately the same position in the light.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 2-6, 8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger (US 6,781,135) in view of Stuik *et al.* (Absolute calibration of a multilayer-based XUV diagnostic, Nuclear Instruments & Methods in Physics Research A, Vol. 492, no. 1-2 (11 October 2002), pp. 305-316).

In regard to claim 2 which is dependent on claim 1 in so far as understood, the apparatus of Berger lacks an explicit description that the photoelectric conversion element measures the light intensity in a range where a solid angle viewed from the light intensity detector unit to a condensed point of the light is below 0.024 steradians. However, Berger also discloses (column 5, lines 26-49) to provide multilayer mirrors which are designed to reflect light having the desired properties (e.g., angular bandwidth). Further, multilayer mirrors are well known in the art. For example, Stuik *et al.* teach (section 3.6 on pg. 310) to use a well defined area on the mirror which would allow a collection angle of $\sim 8.40 \mu\text{sr}$ for the mirror which is typically located at a distance of $\sim 116.5 \text{ cm}$ from the source. Therefore it would have been obvious to one

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having ordinary skill in the art at the time of the invention to provide a solid angle (e.g., below 0.024 steradians) viewed from the light intensity detector unit to a condensed point of the light in the apparatus of Berger, in order to use only a well defined area of the mirror.

In regard to claims **3** and **5** (which are dependent on claim 1 in so far as understood) and claim **4** (which is dependent on claim 1), the apparatus of Berger lacks an explicit description that the light intensity detector unit is arranged on a plane arranged in the light or on a spherical surface that is rotatable around an optical axis of the light and has a center at a condensed point defined by the light source which condenses the light emitted at an emission point and diverges the light at a predetermined divergent angle. However, Berger also discloses (column 6, lines 5-27) to position detectors so that each bore was oriented facing the source. Further, *Stuik et al.* teach (section 1 on pg. 305-306) that each source possesses specific spatial distribution, repetition rate, and stability. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to arrange a finite set of detectors onto a surface which faces the source and to repetitively measure the light at different measurement positions (e.g., by rotation of the finite set of detectors around an optical axis of the light) in the light in the apparatus of Berger, in order to determine specific spatial distribution, repetition rate, and stability of a source.

In regard to claim **6** which is dependent on claim 1, the apparatus of Berger lacks an explicit description that the incident angle of the light upon the mirror is 20° or smaller in the light intensity distribution detector unit. However, Berger also discloses (column

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5, lines 26-49) to provide multilayer mirrors which are designed to reflect light having the desired properties (e.g., angular bandwidth). Further, multilayer mirrors are well known in the art. For example, Stuik *et al.* teach (section 2 on pg. 307) to use approximately normal incidence geometry (see Fig. 10) for multilayer mirrors which have the advantage over optics used at 45° due to the absence of polarization effects by the multilayer reflection. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a mirror (e.g., a mirror designed for normal incidence) in the apparatus of Berger, in order to avoid polarization effects of the multilayer reflection.

In regard to claim 8 which is dependent on claim 1 in so far as understood, Berger also discloses (column 5, line 66 to column 6, line 1; Figs. 1 and 2) that the incident angle (e.g., 45°) of the light upon the mirror (70) is approximately equal to a Brewster angle for the light in the light intensity distribution detector unit (60) since a “... Brewster angle is 42.6° for the EUV light having a wavelength of 13.5 nm ...” (see lines 7-12 on pg. 12 of the specification). The apparatus of Berger lacks an explicit description that the light intensity distribution detector unit has plural mirrors and photoelectric conversion elements corresponding to the respective mirrors, the light incident upon the plural mirrors plural surfaces is orthogonal to plural surfaces that has light reflected by each of the plural mirrors. However, Berger also discloses (column 6, lines 5-27) to position detectors so that each bore was oriented facing the source. Further, Stuik *et al.* teach (section 1 on pg. 305-306) that each source possesses specific spatial distribution, repetition rate, and stability. Therefore it would have been

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obvious to one having ordinary skill in the art at the time of the invention to provide plural photoelectric conversion elements corresponding to respective plural mirrors in the light in the light intensity distribution detector unit of the apparatus of Berger, in order to simultaneously determine specific spatial distribution, repetition rate, and stability of a source.

In regard to claim **12** which is dependent on claim 11, the method of Berger lacks an explicit description of repetitively measuring the light at different measurement positions in the light. However, Berger also discloses (column 2, lines 2-7) that EUV sources are known and further that new EUV sources are being developed. Further, Stuijk *et al.* teach (section 1 on pg. 305-306) that each source possesses specific spatial distributions, repetition rate, and stability. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to repetitively measure the light at different measurement positions in the method of Berger, in order to determine specific spatial distributions, repetition rate, and stability of a source.

Conclusion


14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SL


CONSTANTINE HANNAHER
PRIMARY EXAMINER